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INVENTORY OF POLICY INTERVENTIONS – GHANA

DRAFT

POWER AFRICA TRANSACTIONS AND REFORMS
PROGRAM (PATRP)

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INVENTORY OF POLICY INTERVENTIONS – GHANA

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DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

The following draft report falls within the Policy Work Order (WO-17-US-03) of Power Africa/PATRP (PATRP Objective 4b).

This draft report was primarily generated by reviewing and analyzing published material on Ghana's energy sector, a non-exhaustive list of which is included in the References section. In addition, the report draws upon, and incorporates the collective expertise provided by PATRP's in-country team and other technical advisory staff. In particular, the insights provided by the in-country team have ensured that any policy interventions that we have proposed are focused on removing barriers to advancing actual or prospective Power Africa transactions.

In its current draft form, this report represents a working document that will be shared, and discussed further, with USAID. Therefore, any policy interventions included herein are preliminary in nature. Upon further direction by USAID, our recommended policy interventions can be augmented and verified by means of in-country due diligence assessments.

This draft report was submitted for review to the Activity Manager leading the Power Africa Policy Work Order on 15 October 2015.

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ACRONYMS

Acronym	Definition
AFD	Agence Française de Développement (French Development Agency)
AfDB	African Development Bank
APSD	African Plantations for Sustainable Development
CCGT	Combined cycle gas turbine
CTI PFAN	Climate Technology Initiative – Private Financing Advisory Network
DANIDA	Danish International Development Agency
DFO	Diesel fuel oil
DSM	Demand Side Management
EC	Energy Commission
ECG	Electricity Company of Ghana
ECOWAS	Economic Community of West African States
EIA	Energy Information Administration
EPA	Environmental Protection Agency
FIT	Feed-in-tariff
GCSA	Government consent and support agreement
GEDAP	Ghana Energy Access and Development Project
GH¢	Ghanaian Cedi
GIF	Ghana Infrastructure Fund
GIPC	Ghana Investment Promotion Center
GiZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (“German Federal Enterprise for International Cooperation”)
GNGC	Ghana National Gas Company
GNPC	Ghana National Petroleum Company
GoG	Government of Ghana
GRIDCo	Ghana Grid Company
GW	Gigawatt
GWh	Gigawatt hour
ICB	International competitive bidding
IEA	International Energy Agency
IMF	International Monetary Fund
IPP	Independent power producer
IRP	Integrated resource plan
IRRP	Integrated Resource and Resilience Plan
JICA	Japan International Cooperation Agency
JV	Joint venture

Acronym	Definition
kfW	German (Government) Development Bank
kV	Kilovolt
kVA	Kilovolt-ampere
kWh	Kilowatt hour
LCGP	Least-cost (power) generation plan/project
LCO	Light cycle oil
LNG	Liquefied natural gas
LOC	Letter of Credit
MCC	Millennium Challenge Corporation
MiDA	Millennium Development Authority
MMSCFD	Million standard cubic feet per day
MOFEP	Ministry of Finance and Economic Planning
MOP	Ministry of Power
MOPET	Ministry of Petroleum
MW	Megawatt
NEDCo	Northern Electricity Distribution Company
NES	National Electrification Scheme
NITS	National Interconnected Transmission System
O&M	Operations and Maintenance
ORET	Dutch Development Related Export Transactions Program
PATRP	Power Africa Transactions and Reforms Program
PCOA	Put call options agreement
PPA	Power purchase agreement
PPP	Public private partnership
PPU	Private Power Unit
PRG	Partial Risk Guarantee
PURC	Public Utilities Regulatory Commission
PV	Photovoltaic
R & D	Research and Development
REFIT	Renewable energy feed-in tariff
SECO	Swiss State Secretariat for Economic Affairs
SHEP	Self-Help Electrification Project
SIDA	Swedish International Development Agency
SOE	State-owned enterprise
TAPCO	Takoradi Power Company
TICO	Takoradi International Company
UN	United Nations
USAID	United States Agency for International Development
USTDA	US Trade and Development Agency (USTDA)

Acronym	Definition
VRA	Volta River Authority
WAGP	West African Gas Pipeline
WAPP	West African Power Pool
WEM	Wholesale Electricity Market

EXECUTIVE SUMMARY

Like much of the rest of sub-Saharan Africa, and especially the Power Africa focus countries, Ghana has very ambitious plans to fully electrify the entire nation, create and maintain an efficient and transaction-friendly power market and support cleaner energy sources to mitigate climate change. While Ghana has done well in expanding access to electricity, with a national access rate of 80.6%, performance in adding new generation capacity has been lacking. Despite its numerous energy development plans, which include provisional licensing to approximately 129 prospective power generation projects, the bulk of which are sponsored by independent power producers (IPPs), few of these plans have translated into investment to date.

With a total installed capacity of 2,965 MW and a dependable capacity of 2,541 MW, mainly through hydroelectric and thermal generation, Ghana should be in a position to satisfy its daily peak demand of 1,900 - 2,100 MW. However, due to lower water levels at its hydroelectric facilities combined with ongoing maintenance and fuel supply issues, load shedding has become a problem in the country.

In encouraging the involvement of IPPs in the sector, Ghana has passed public procurement legislation and established an agency to oversee the public procurement process. However, the sector is frustrated by constrained access to fuel sources (in the case of thermal generation), and the absence of credit-worthy off-takers affecting the bankability of transactions. Furthermore, the process for developing IPP generation projects is not well defined, with IPPs approaching multiple entities in their efforts to progress their projects.

What Ghana lacks to move these IPPs forward is a more effective procurement system. Instead of relying on unsolicited and directly negotiated deals, Ghana should initiate timely international competitive tenders for power projects, coupled with a clear contracting framework including standardized power purchase agreements (PPAs) and government consent and support agreements (GCSAs). Competitive tenders can be used for both thermal and renewable energy. Experience in other emerging economies and developing countries has shown that competitive tenders result in lower prices. The existing renewable energy feed-in tariffs (REFITs) might be retained for smaller projects.

Ghana can also not afford to take on significant amounts of new contingent liabilities associated with GCSAs which provide support in the event that the Electricity Company of Ghana (ECG) is unable to meet its obligations under the PPAs with IPPs, given restructuring requirements by the International Monetary Fund (IMF) and the World Bank. Thus, without serious restructuring of the country's utilities to make them more transaction friendly and credit-worthy, there will continue to be fewer transactions for cleaner power than there should be. The Government of Ghana (GoG) needs to allow the electricity economic regulator, the Public Utilities Regulatory Commission (PURC), to follow through with its proposed tariff increases and move them to cost-reflectivity. Although this may be difficult for consumers in the short term, it should decrease prices in the long term, while improving the quality of service, given the additional projects closed, plants in operation, and sources of supply brought online.

A Private Power Unit (PPU)¹ is needed to oversee the running of competitive tenders for IPPs. In addition, mechanisms to assist project developers, such as the Climate Technology Initiative – Private Financing Advisory Network (CTI PFAN), which is already active in the region, should be utilized as a service for both project developers and investors.

Recommended policy interventions are summarized in Table 1 below.

¹ We understand from PATRP’s Transaction Advisor in Ghana that efforts to commence a work stream to develop a PPU which would lead to international competitive tenders and least cost generation acquisition planning met with significant resistance from local government stakeholders. However, we still believe that this is an important policy intervention to be mentioned in this Draft Report, at this stage.

TABLE 1: RECOMMENDED POLICY INTERVENTIONS To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity					
Area of Focus	Barriers	Associated Principle	Recommended Intervention(s) *Prioritized by Impact*	Effect of Intervention	Technical Assistance Required
Energy policies	Too few IPPs are reaching financial close and struggle to secure finance because of the lack of credit-worthiness of the off-taker utility, ECG and the difficulty of arranging credit support and risk mitigation	Increased clean energy share	Assist the GoG to develop a credit support package to create bankable IPP transactions (including use of the GCSA and where possible some combination of other credit enhancement tools (LOCs, PRGs, Insurance, etc.)	Several clean energy projects achieving financial closure through investment by private investors supported by appropriate credit enhancement and risk mitigation	Support with the development of credit support and risk mitigation packages meeting international lender and commercial bank requirements ²
Energy regulatory framework and tariffs	Tariffs not cost reflective which impacts negatively on the credit-worthiness of the utilities and their ability to support investment	Cost-reflective retail tariff structures	Assist PURC to develop cost-reflective tariffs	Utilities are creditworthy off-takers for IPPs	Support provided to PURC and GoG in agreeing to and honoring tariff revisions and developing a cost reflective tariff framework for implementation going forward ³

² PATRP's Transaction Advisor is currently working with both the MOP and several IPPs on a new instrument incorporating a PCOA which may enable the GoG to avoid debt treatment under the IMF agreement while enabling IPPs to satisfy the requirements of international lenders.

³We understand that PURC is being assisted by MCC in its current round of tariff reviews.

TABLE 1: RECOMMENDED POLICY INTERVENTIONS To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity					
Area of Focus	Barriers	Associated Principle	Recommended Intervention(s) *Prioritized by Impact*	Effect of Intervention	Technical Assistance Required
Power sector development plans/integrated resource plans/generation master plans	No clear and long-term integrated resource plan (IRP) to meet renewable energy integration targets with power expansion	Sound, strategic and integrated power sector planning	Assist the GoG with development of an Integrated Resource and Resilience Plan (IRRP) that reflects the country's goals for increased renewable energy generation, with utilities and institutions having the capacity to follow plan guidelines	Integrated approach to power sector planning, increased clean energy share, development of sustainable capacity within the GoG going forward for integrated power sector planning	Assist the GoG (MOP, MOPET, MOFEP and Ministry of Finance) with development of an IRP, aimed at an integrated approach to power sector planning and development on a nationwide basis. Build capacity for undertaking IRPs in the future ⁴

⁴ We understand that USAID is currently evaluating proposals for a multi-year IRRP program which will likely commence at the beginning of 2016.

TABLE 1: RECOMMENDED POLICY INTERVENTIONS To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity					
Area of Focus	Barriers	Associated Principle	Recommended Intervention(s) *Prioritized by Impact*	Effect of Intervention	Technical Assistance Required
Power generation procurement framework and processes	No clear IPP procurement framework with the result that there are too many unsolicited bids subject to direct negotiations but with far too few actually translating into investments and construction	Clear and transparent procurement processes	<p>Implement a rigorous International Competitive Bidding (ICB) framework for procuring least-cost power generation projects</p> <p>Create a PPU to manage competitive procurement of IPPs supported by experienced transaction advisors</p>	Streamlined procurement and bidding process for IPPs, implemented by a dedicated, well-resourced institution	<p>Assist the GoG with the design of the ICB framework including preparing standardized draft PPAs and other relevant commercial agreements (Implementation Agreement, Direct Agreement, Grid Connection Agreements)</p> <p>Assist the GoG with the organizational design and establishment of the PPU.</p> <p>Provide transaction advice when running competitive tenders⁵</p>

⁵ We understand from PATRP's Transaction Advisor that efforts to commence a work stream to develop a PPU which would lead to ICB and least cost generation acquisition planning met with a stone wall. However, we still believe that this is an important policy intervention to be mentioned in this Draft Report, at this stage.

TABLE 1: RECOMMENDED POLICY INTERVENTIONS To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity					
Area of Focus	Barriers	Associated Principle	Recommended Intervention(s) *Prioritized by Impact*	Effect of Intervention	Technical Assistance Required
Electrification targets, planning and execution (for grid and off-grid)	While Ghana has been very successful in its electrification program, universal access goals will probably not be met without a better articulation of grid and off-grid options.	Universal electricity access, achieved through the strategic use of on-grid, off-grid, and small-scale solutions	On-grid and off-grid electrification policy articulated with attractive incentives for investors, developers and consumers, including the design of a subsidy structure for off-grid solutions to ensure financial viability of such projects	Universal access to energy	Assist the GoG with enhancing their electrification planning, including the mix between mini-grid and off-grid options and the design of a subsidy structure to ensure the financial viability of off-grid projects ⁶
Gender equality and female empowerment	Assumption: Insufficient capacity to apply and implement gender-sensitive policy provisions	Gender equality and female empowerment	Provide for participation in training and development activities. Identify opportunities to support the implementation of the ECOWAS gender mainstreaming policy	Strengthened implementation of National Energy Policy and energy sector strategy action plan with respect to gender issues and increased women's participation in the sector	Gender mainstreaming workshop(s) and resources, and the promotion of women in the sector through the Women in African Power Network

⁶ We understand from PATRP's Transaction Advisor that the renewables work stream, currently under finalization, will support off-grid/mini-grid activities, as well as assist the MOP, Energy Commission and other stakeholder to evaluate the long list of potential renewable energy projects.

1 PROFILE OF GHANA'S ENERGY SECTOR

1.1 GENERATION CAPACITY AND MIX

Generation capacity: Ghana's current installed generation capacity is 2,965 MW with just over half of this capacity generated by hydro-electric plants and the remaining being thermal generation. About two-thirds of energy generation facilities are owned and operated by the state owned Volta River Authority (VRA) and the remaining third by IPPs (see Table 2). With a dependable capacity of 2,541 MW, Ghana should have sufficient generation capacity to meet its estimated daily peak demand of 1,900 - 2,100 MW. Unfortunately, due to low water levels at its hydro-electric facilities, scheduled and unscheduled maintenance at its state owned thermal facilities and persistent fuel supply issues, available capacity is approximately 1,555 MW (as of September 2015). This situation has resulted in a daily deficit of between 345—545 MW, leading to load shedding which can last for to up to 24 hours in parts of the country. A recently completed study on electricity demand forecasting and suppressed demand prepared by Nexant indicates that the level of suppressed demand is between 15% and 30% of current supply.

When added to the current level of load shedding, Ghana is in need of an additional 600 to 1,000 MW of additional available capacity. This can only be achieved by improving the availability of its existing thermal facilities and the installation of additional generation capacity, since it is impossible to predict when and if hydrology will be sufficient to run existing hydroelectric facilities at historical levels. Additional capacity will be commissioned in 2015 including a 110 MW extension to the Takoradi International Company (TICO) IPP and a new 200 MW VRA plant near Kpone.

IPP involvement: To date, the VRA has used the public procurement process as a vehicle for new generation capacity, with both the Takoradi 3 and Takoradi 4 plants managed through a tender process. Despite these relative successes, Ghana has chosen to manage the other IPP transactions through direct negotiations. Ongoing efforts to create standardized documentation have resulted in transaction documents which are not "bankable" and the process for developing IPP generation projects is not well defined, with IPPs approaching multiple entities in their efforts to progress their projects.

There are four pseudo-IPPs currently operating thermal plants in Ghana (see Table 2). TICO is a joint venture between VRA and an IPP developer which was supported by the Abu Dhabi wealth fund. CENIT was financed by SSNIT, the GoG social security system. As a consequence, none of these IPPs were required to access funding from international lenders, and would not be classified as traditional IPPs which rely on financing from the international lending community. A fifth IPP, the 340 MW Cenpower, gas and oil-fired plant is being developed by African Finance Corporation and is scheduled for commissioning by 2017. This is the first true greenfield IPP transaction in Ghana to date.

TABLE 2: GHANA'S INSTALLED GENERATION ⁷			
Facility	MW	Type	Operator
Akosombo	1,020	Hydro	VRA
BUI Power	400	Hydro	VRA
Kpong	160	Hydro	VRA
Solar	2	Solar	VRA
Takoradi TAPCO (T1)	330	Thermal	VRA
Tema Thermal 1 PP	110	Thermal	VRA
Tema Thermal 2 PP	50	Thermal	VRA
T3 Magellan PP	132	Thermal	VRA
Mines Reserve Plant (MRP)	80	Thermal	VRA
TICO (T2)	330	Thermal	Pseudo-IPP
Sunon Asogli	200	Thermal	Pseudo-IPP
CENIT	126	Thermal	Pseudo-IPP
Trojan Power	25	Thermal	Pseudo-IPP
Total	2,965		

Fuel supply: In the area of fuel supply, Ghana has made considerable progress over the past two years in developing its offshore oil and gas fields which will supply natural gas to the Western part of Ghana. For example, the gas processing plant at Atuabo began processing wet gas from the Jubilee field in early 2015 and was subsequently commissioned to operate at full capacity of 120 million standard cubic feet per day (mmscfd). Development of the Sankofa field, scheduled to begin operations in 2018 and capable of producing 180 mmscfd of natural gas (representing an \$8 billion investment), recently reached an important milestone with the announcement of World Bank support to the project in the form of a USD 500 million partial risk guarantee, thereby increasing the likelihood that sponsors (ENI and Vitol) will be able to achieve financial close. In Eastern Ghana, thermal power generation facilities located in Tema continue to experience erratic fuel supply from the West African Gas Pipeline (WAGP) which is contracted to deliver 120 mmscfd of natural gas which originates in Nigeria. Since the WAGP was brought back online in 2014 (after a year of being offline due to the repair of a rupture off the coast of Togo), the daily supply of gas has been highly erratic, averaging 60 mmscfd over the past year. The erratic supply of natural gas via the WAGP has forced the Tema generation plants to run on costlier and less efficient fuels. Unfortunately, at this time there is no installed pipeline to transport natural gas from the Western region to the Eastern region of the country. Options considered to address the problem include the construction of a new overland gas pipeline as well as a reverse flow option on the WAGP.

1.2 ELECTRICITY ACCESS LEVEL AND TARGETS

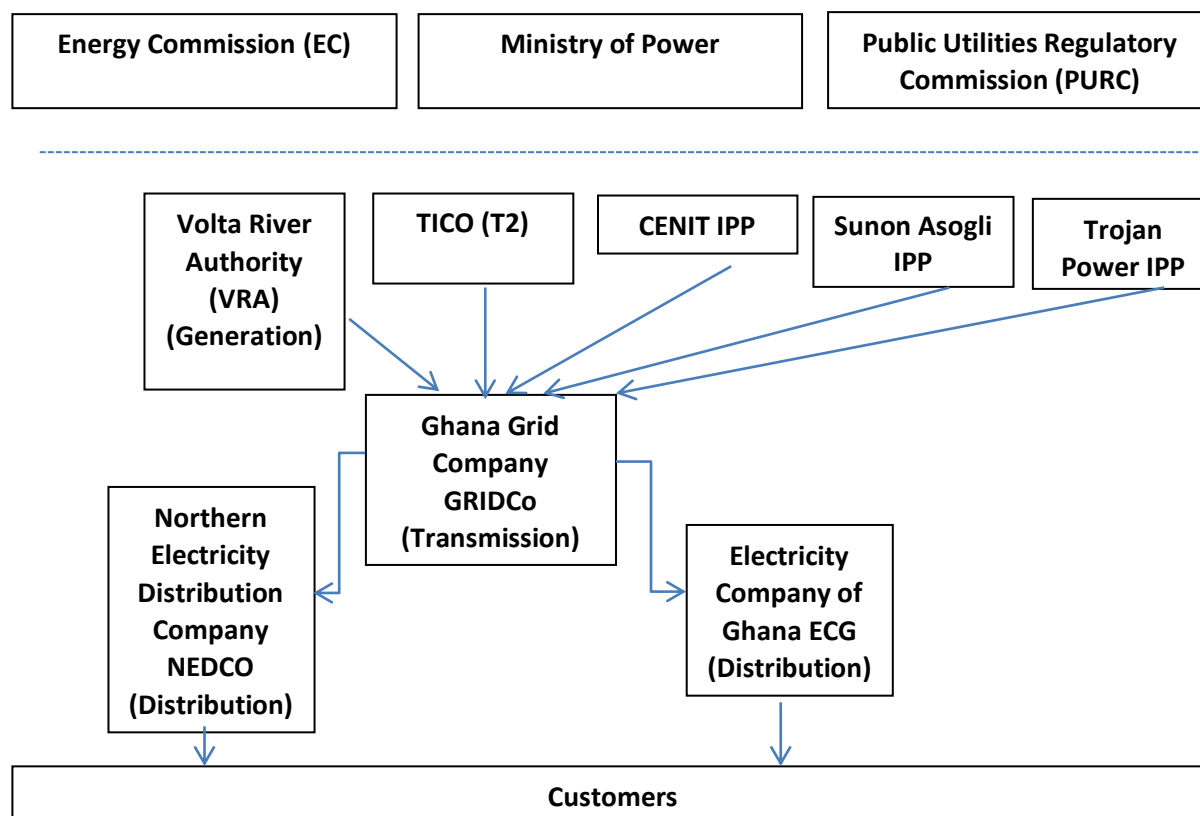
According to the International Energy Agency (IEA), Ghana's overall electricity access rate for grid-connected and off-grid households is 80.5% as of September 2015, with an urban electrification rate in excess of 90%. Rural electrification ranges between 52% up to the mid- to high-seventy percent level. The IEA has cited Ghana as one of the most successful countries in sub-Saharan Africa in increasing electrification rates ever since the launch of its National Electrification Scheme (NES) in 1989. The GoG plans to provide for energy access to 90% of its total population by 2020.

⁷ Volta River Authority (VRA): <http://www.vra.com/resources/facts.php>

1.3 POWER MARKET STRUCTURE, INCLUDING IPP PARTICIPATION

The structure of Ghana's power sector is shown in Figure 1.

FIGURE 1: GHANA POWER MARKET STRUCTURE



Ghana is one of the few African countries with an unbundled power sector: generation is separate from transmission and there are also two separate distribution companies. IPPs are also permitted and have contracts with the grid company.

1.4 KEY SECTOR INSTITUTIONS AND MANDATES

The Ministry of Power is responsible for overseeing electricity production and infrastructure development, including generation, transmission, and distribution, and the efficient operation of the national utilities. It also oversees the National Electrification Scheme (NES) for universal electrification (see Section 2.1).

The Ministry of Petroleum is responsible for developing and implementing petroleum sector policy in Ghana. It also supervises the operations of the Ghana National Petroleum Corporation and the Tema Oil Refinery.

The Public Utility Regulatory Commission (PURC) is the independent regulatory body established to approve tariff rates for electricity customers and performance standards for energy sector operators.

The Energy Commission (EC) is mandated to plan, regulate, manage and develop energy supply and utilization in Ghana. It oversees legal, regulatory and supervisory functions (aside from pricing) for all providers of energy in Ghana. The EC also manages and develops the utilization of energy resources and grants licenses for the transmission, wholesale, supply, distribution, and sale of electricity and natural gas refining, storage, bulk distribution, marketing and sale of petroleum products.

The Volta River Authority (VRA) is a GoG-owned entity that generates electric power for industrial, commercial and residential users across Ghana.

GRIDCo operates all transmission services and wholesale market operations.

The Electricity Company of Ghana (ECG) is a limited company that is wholly owned by the GoG under the Ministry of Power. It is in charge of electric power distribution for the southern half of the country. ECG handles about 90% of retail power sales and has about 2.6 million customers. It purchases power from the VRA at a bulk tariff.

Northern Electricity Distribution Company (NEDCo) is a wholly-owned subsidiary of VRA. It is responsible for the distribution of electricity in the northern regions (approximately 10% of the population).

The Ghana National Gas Company (GNGC) is the GoG-owned company that monetizes Ghana's natural gas resources, imports gas for the power industry, and functions as a catalyst for downstream petrochemical industries.

The Ghana National Petroleum Corporation (GNPC) is the government-owned company that partners with international petroleum companies to develop Ghana's oil and gas resources.

The Ghana Infrastructure Fund (GIF) was set up in 2015 to address Ghana's infrastructure deficit and increase employment. It is chaired by the Minister of Finance and focuses on partnerships with the private sector including special-purpose vehicles (SPVs), joint ventures (JVs) and public private partnerships (PPPs).

The Ghana Investment Promotion Centre (GIPC) is the government agency tasked to implement an investor-friendly set of rules and regulations to boost private sector investments in all sectors except mining, which is handled by the Ghana Chamber of Mines, and petroleum which is covered by the Ghana National Petroleum Corporation.

The Millennium Development Authority (MiDA) was created by the GoG to oversee the Millennium Challenge Corporation (MCC) Compact for Ghana focusing on energy. It also oversees and manages other national development programs of similar nature funded by the GoG, development partners or both.

1.5 STATE OF THE UTILITY

VRA. According to VRA's 2014 Annual Report, it suffered an operating loss in 2014 of GH¢74.13 million (approximately USD 18,3 million).

The VRA has also experienced difficulties in paying for fuel due to what it claims is non cost-reflective tariffs set by the PURC. As a result, oil suppliers view it as a high-risk client. In response to

the difficulties experienced by the VRA, Power Minister Kwabena Donkor told the Africa Energy Forum in Dubai on June 9, 2015 that the VRA will be split into two entities: a public utility that will control the thermal generation business with the private sector while the other entity will focus on hydropower.

GRIDCo. GRIDCo is generally considered a “well-run company” and the only power utility in Ghana that is financially viable. The World Bank, in 2013, noted that GRIDCo was “the only creditworthy utility in the country,” with profits of USD 56 million in 2011, about USD 24 million for 2012 and a projected USD 33 million in 2013. The reasons for lower profits after 2011 are attributed to transmission service charges not being increased by PURC, as well as ECG’s debt to GRIDCo which grew to USD 43 million. GRIDCo has sought financing from private commercial banks, without government guarantees, and has accepted loan covenants, such as an appropriate debt service coverage ratio. The Agence Française de Développement (AFD) provided a sovereign concessional loan in 2012 of EUR 141 million to GRIDCo plus a EUR 4.8 million complementary grant offered by the EU-Africa Infrastructure Trust Fund for a project focusing on the reinforcement of Ghana’s electricity grid, including an interconnection with Burkina Faso.

As Table 3 shows, GRIDCo has experienced an increase in transmission losses, although these losses are in line with both increased generation and international benchmarks (the average transmission losses in the US for 2013 was 5% according to the Energy Information Administration (EIA)).

TABLE 3: GRIDCO TRANSMISSION LOSSES⁸										
Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Transmission losses (GWh)	249.0	318.0	256.0	303.0	343.0	380.0	531.0	522.0	569.7	565.1
Losses as a % of net generation	3.3	3.5	3.5	3.5	3.8	3.7	4.7	4.3	4.8	4.3

ECG. ECG is not viewed as a creditworthy off-taker by international lending institutions and commercial banks due to non-cost reflective tariffs, under-investment, mismanagement, high arrears (accounts receivables) from other state-owned enterprises (SOEs), etc. Its technical and commercial losses are shown in Table 4.

TABLE 4: ECG PURCHASES AND SALES⁹										
Electricity Purchases and Sales by ECG Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Purchases (GWh)	5,045	5,253	5,146	5,799	6,052	6,771	7,259	7,944	8,479	8,370
Total Sales (GWh)	3,761	3,978	3,906	4,335	4,442	4,952	5,339	6,041	6,476	6,246
Distribution Losses (GWh)	1,285	1,275	1,240	1,464	1,610	1,819	1,920	1,903	2,003	2,124
Percentage Losses	25.5	24.3	24.1	25.2	26.6	26.9	26.4	24.0	23.6	25.4

⁸ EC National Energy Statistics 2005 – 2014, April 2015;
http://energycom.gov.gh/files/Energy%20Statistics_2015.pdf

⁹ EC National Energy Statistics 2005 – 2014, April 2015;
http://energycom.gov.gh/files/Energy%20Statistics_2015.pdf

ECG's distribution losses of over 25% are certainly on the higher side, which has been one of the ongoing problem areas for this utility. ECG must pay for the "lost" energy it buys from VRA, but does not earn any revenue on it. According to the World Bank, reducing these losses by 10% would save USD 85 million/year. The ECG declared a loss of GH¢108.75 million (approximately USD 26.9 million) in 2012 and is expected to have generated much higher losses for 2013. It has also been unable to collect the debt owed to it by the GoG and other public-sector bodies, which amounted to GH¢ 428.2 million (approximately USD 107.5 million) as of 2013. According to the World Bank, for mid-year 2012, ECG owed 60% more at the beginning of 2012 to its main suppliers (VRA, GRIDCo, and Sunon Asogli Power Plant) – a total of GH¢ 402 million (approximately USD 100.5 million). More recent numbers are not available.

NEDCo. The financial and technical performance of NEDCo is also poor. Table 5 shows its technical and commercial losses as reported by the EC:

TABLE 5: NEDCO PURCHASES AND SALES¹⁰										
Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total purchases (GWh)	501	507	494	529	566	635	719	822	937	998
Total sales (GWh)	365	356	365	392	404	473	581	658	737	758
Distribution losses (GWh)	136	151	129	137	162	162	138	164	200	239
Percentage losses	27.1	29.8	26.1	25.9	28.6	25.5	19.2	20.0	21.3	24.0

NEDCo services up to 64% of Ghana's land area, but has no large industrial customers. According to the World Bank, the GoG passes on NEDCo's operational cost burden to the VRA with the challenge to invest in rural electrification through capital subsidies. VRA is unable to recover these costs through the bulk supply tariff, and there is no funding mechanism in place via the overall retail tariff structure set by PURC to compensate VRA for the subsidy to NEDCo. In addition to losses, NEDCo suffers from poor customer supply voltages, frequent outages due to line breakdowns, and overloaded distribution transformers, rendering it unable to connect sufficient new customers.

In response to the problems experienced by NEDCo and ECG, Ghana's Power Minister Kwabena Donkor told the Africa Energy Forum in Dubai on June 9, 2015 that both ECG and NEDCo are to be restructured in the coming months to improve their service delivery to consumers and to strengthen their financial performance to better honor PPAs with IPPs. This effort can complement Power Africa's private sector participation initiative for ECG and NEDCo, which should act as a catalyst for more reliable and improved access to electricity.

¹⁰ EC National Energy Statistics 2005 – 2014, April 2015;
http://energycom.gov.gh/files/Energy%20Statistics_2015.pdf

2 GHANA'S ENERGY POLICY FRAMEWORK

2.1 ENERGY POLICIES

Ghana has made significant policy and sector reforms over the last 25 years to attract foreign and private investment in cleaner energy through unbundling its utilities as well as inviting IPPs. However, there are gaps that need to be addressed and the overall enabling environment for IPPs is still problematic. There are many prospective IPPs but too few of these unsolicited proposals are translated into actual investments. A key policy area that needs resolving is whether to opt for competitive bids rather than directly negotiated deals. There also needs to be a greater commitment to improve the governance and performance of the distribution companies so that customer revenues can support new investment in the sector.

The 2010 National Energy Policy includes a target of generating 500 MW of grid-connected renewable energy (other than large hydro), which would amount to roughly 10% of the total 5,000 MW installed electricity capacity by 2020. This is a serious commitment given that non-large hydro renewable energy contributed less than 2% of total installed capacity in 2010 of about 2,700 MW. The mechanisms for achieving this target are laid out in the 2011 Renewable Energy Act and include a renewables purchase obligation on the country's two main electricity distributors and bulk end users, a REFIT for renewable energy, and a renewable energy fund.

The renewables purchase obligation mandates electricity distribution companies and 30 bulk customers to purchase a specified percentage of power from renewable sources or pay a premium to the EC. There is also a REFIT policy with fixed tariffs for a 10 year contract period. Although this is certainly a step forward, the extent to which the EC has enforced this purchase obligation on Ghana's distributors and large users is unclear.

The energy policy also makes provision for a Renewable Energy Fund whose stated objective is to provide financial resources for the promotion, development, sustainable management and utilization of renewable energy sources. Funds are applied primarily towards financial incentives, feed-in tariffs, capital subsidies, production-based subsidies and equity participation for renewable energy development. The GoG has also pledged support through resource assessments and the support of R&D projects.

Since 1989, the GoG's principal policy for expanding energy to the entire population has been the National Electrification Scheme (NES), which has an ambitious plan of expanding access to 100% of the population by 2020. A complementary program to NES is the SelfHelp Electrification Project (SHEP), where communities that are within 20 km of an existing 33 kV or 11 kV sub-transmission line can qualify for electrification if they procure all the power poles and have a minimum of 30% of the houses within the community wired. Once these conditions are met, the GoG provides the conductors, pole top arrangements, transformers and other installations needed to provide supply to the community. At the start of NES, Ghana's electrification rate was 28%. Ghana now ranks second behind South Africa in electrification rates in sub-Saharan Africa. The program was rolled out in two steps. The first was an extension of the national grid to all 110 political district capitals (at that time) and towns and villages en route to the district capitals. The second was to electrify

communities based on the most economically viable projects. All district capitals were electrified by 2005. The program was also done with annual budgetary allocations and bi-lateral and multi-lateral loans.

It is more likely that Ghana's electrification rate will stand at 90% by 2020, with connectivity in the northern two-thirds of Ghana well below 90%. In addition, remote areas, particularly surrounding the Volta basin, will remain off-grid for the foreseeable future. The GoG has embarked on an analysis of off-grid solutions and is pilot testing such systems. This will lead to the next step, which is a resolution of how such systems will operate in a market that requires all on- and off-grid systems to charge the same end-user tariffs as required by the PURC. Under this requirement, off-grid solutions encounter difficulty achieving financial viability without some sort of subsidy structure.

2.2 ENERGY LAWS

Ghana does not have a single source of law for its power sector, such as an electricity law. Instead, the existing legal framework for the power sector has developed over time as the GoG established the institutions and state-owned electricity companies. Specific acts have included:

- Public Utilities and Regulatory Commission Act, 1997 (Act 538) (the PURC Act): This act established the PURC as the responsible body for the regulation of public utility services to consumers. Under the PURC Act, the PURC, among others, approves rates chargeable by public utilities, ensures competition among public utilities, monitors standards of performance of public utility service provision, and ensures the protection of consumer rights.
- Energy Commission Act, 1997 (Act 541): The Energy Commission Act established the EC with the main objective of regulating and managing the utilization of energy resources in the Republic of Ghana and to coordinate all policies in relation to them. The Commission is responsible for granting licenses to public utilities for the transmission, wholesale supply, distribution and sale of electricity and natural gas in Ghana. Subsidiary regulations and rules include the Electricity Transmission (Technical, Operational and Standards of Performance) Rules, 2008 (LI 1934), the Electricity Regulations, 2008 (LI 1937) and the National Electricity Grid Code, 2009, which sets out the requirements, procedures, practices and standards that govern the development, operation, maintenance and use of Ghana's National Interconnected Transmission System (NITS). The overarching objective of the Code is to ensure that NITS provides fair, transparent, non-discriminatory, safe, reliable, secure and cost-efficient delivery of electrical energy.
- Renewable Energy Act, 2011 (Act 832): aims to promote, develop, manage, utilize, sustain and ensure an adequate supply of renewable energy resources for power and heat and other related purposes. Renewable energy, as defined by the Act, includes wind, solar, hydro, biomass, biofuel, landfill gas, sewage gas, geothermal energy and ocean energy.
- Environmental Protection Agency (EPA) Act, 1994 (Act 490): The EPA Act established the EPA. The EPA functions as the principal environmental watchdog in Ghana. All power projects must receive approval from the EPA.
- The Ghana Investment Promotion Center Act, 2013 (GIPC Act No 865 of 2013): This Act governs investment in all sectors of the economy, with sector-specific laws for minerals and mining, oil & gas, and free trade zones.

Other relevant acts include the Volta River Development Act, 1961 (Act 46) as well as the Bui Power Authority Act, 2007 (Act 740).

The GoG is also working on a proposed PPP law that will provide clear criteria for the qualification and approval processes for PPP projects. The law will also address one of the key concerns of private investors – that of unsolicited bids – by setting out clear qualification criteria and a process for the procurement of projects. Another significant provision under the proposed PPP law is the establishment of a viability gap scheme to finance projects that have been unable to access financing from other traditional sources but are considered beneficial to the economy.

Renewable energy investors must be registered under Ghanaian law either as a limited liability company under the Companies Act, 1963 (Act 179) or under the Incorporated Private Partnerships Act, 1962 (Act 152).

The sector could benefit from clear IPP or PPP project development guidelines. A single electricity law rather than various laws (such as the PURC, EC and Renewable Energy Act) could possibly foster a more investor-friendly climate for private developers as opposed to the range of current laws that are overseen by multiple entities.

2.3 ENERGY REGULATORY FRAMEWORK AND TARIFFS

The EC and the PURC are the power sector's regulatory bodies. The EC is the technical regulator of the industry and is responsible for assessing applications for licenses, either as generators, transmitters or distributors of electrical power. The PURC, on the other hand sets tariffs and monitors compliance with performance standards of the service providers in the power supply chain; it serves more as an economic regulator. Most countries operate with only a single energy regulator and there is certainly a case to be made that Ghana's regulatory bodies could be consolidated.

The EC is the main authority for issuing licenses and has published the License Manual for Service Providers in the Renewable Energy Industry. All applications for licenses receive notification of approval within 60 days, unless they are denied. Refusals may only be based on the grounds of inadequate technical data, or issues of national security, public safety, food security, health and environmental safety. The wholesale electricity supply license is granted for 20 years; once acquired, licenses are only transferable with the written approval of the Commission. The acquisition process for acquiring a wholesale electricity supply license is divided into three broad stages: stage 1 - acquisition of provisional license; stage 2 - prior to construction; and stage 3 - acquisition of operating license.

The EC has licensed a large number of projects. Excluding all projects that are already constructed or are under construction or have been approved for construction, there were 129 provisional license holders through the EC, including 58 thermal and 71 renewable projects¹¹, representing a total of over 25 GW of potential power generation. Of these, solar accounted for 49 of the license holders, for a total of 3.5 GW, more than the total of all existing generation infrastructure (2.85 GW). Only three renewable energy projects have construction permits; they are for solar, wind and wave projects. Key reasons why so few projects have made it to the third stage are the lack of credit worthy off-takers and that IPPs want more risk guarantees.

¹¹ 19 currently have siting permits, as stated by Acting EC Director for Renewable Energy Efficiency Kwabena A. Out-Danquah, at the ECOWAS Sustainable Energy Policy & Investment High Level Forum

Under the Energy Commission Act, a license may only be granted to a citizen of Ghana, or a corporation registered under the Companies Act, 1963 (Act 179) or under any other law of Ghana, or to a partnership registered under the Incorporated Private Partnerships Act, 1962 (Act 152). This implies that IPPs must incorporate locally, either fully or as external companies. IPPs may also enter into JVs with local entities.

With regard to economic regulation, end-user tariffs are set by PURC and also require parliamentary approval. Regrettably they are not cost-reflective. The VRA has stated that even though PURC has raised tariffs, the increases have not been enough and are currently at a third of what it takes VRA to run thermal power plants. This problem is also recognized by the ECG, which has severely impaired its creditworthiness. However, adhering to its compact with the MCC, the GoG has, after a two-year hiatus, reinstituted annual tariff reviews and mandatory quarterly adjustment mechanisms. These are intended to bring tariffs into alignment with costs over time, but they will still require parliamentary approval. According to the Act, the factors that PURC takes into account when providing guidelines on tariff levels include:

- consumer interest
- investor interest
- assuring reasonable cost of production of the service
- assurance of the financial viability of the public utility
- economic development of the country
- best use of natural resources
- uniformity of prices throughout the country
- competition among utility companies.

For 2015, PURC approved tariff rates of USD 0.04 per kWh for electricity produced by the VRA and USD 0.06 per kWh for electricity produced by IPPs. These tariffs are especially too low for Ghana's growing gas-to-power market. The World Bank noted that PURC's decisions are often perceived as being skewed in favor of the consumers, rather than being balanced and principled or based on national interest. This finding is further supported by what the World Bank reported as a "lack of openness and transparency in regulatory decision making. PURC has adopted a closed approach to decision making. For example, the application of the rate-setting guidelines in deriving tariffs is not demonstrated to stakeholders when tariffs are announced."

There is a clear need for PURC to demonstrate more independence in tariff setting. Another main challenge is staffing constraints and that PURC is unable to retain trained staff.

As mentioned previously, to stimulate investment in the renewable energy sector, Ghana has also established a FIT scheme that includes a renewable energy purchase obligation on electricity distribution utilities or bulk customers and tariffs based on rates approved by PURC. Some IPPs have indicated that the 10 year FIT is not long enough to secure financing. PURC intends to set new 10, 15 and 20 year FITs.

FIT tariff rates as of October 1, 2014 were:

Wind (maximum capacity of 300 MW)

- Wind with grid stability system: GHS 0.557369/kWh
- Wind without grid stability system: GHS 0.514334/kWh

Solar (maximum capacity of 150 MW)

- Solar with grid stability system: GHS 0.644109/kWh - project capacity cannot exceed 20 MW
- Solar without grid stability system: GHS 0.583629/kWh - project capacity cannot exceed 10 MW

Small hydro

- Projects < 10 MW: GHS 0.536223/kWh
- Projects between 10-100 MW: GHS 0.53884/kWh

Biomass

- GHS 0.560075/kWh
- Biomass using enhanced technology: GHS 0.590350/kWh
- Biomass using plantation as feed stock: GHS 0.632891/kWh

In summary, some of the main incentives for private industry provided by Ghana's regulatory framework include:

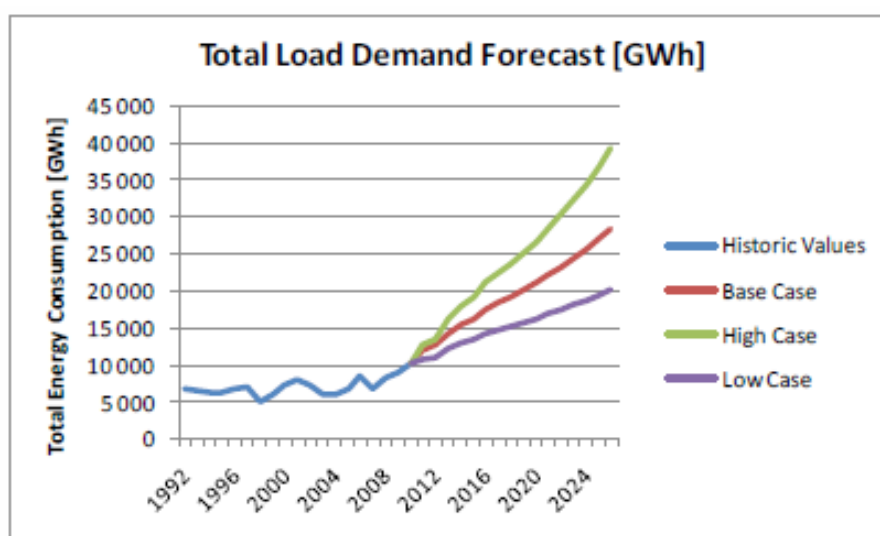
- Exemption from import duty on renewable energy equipment
- Development of codes and standards for solar, wind and bio-energy systems
- Regulations and procedures exist to ensure that all renewable energy service providers are provided with licenses/permits and PPAs
- FITs for energy generated by renewable sources and IPPs have been published.

2.4 POWER SECTOR DEVELOPMENT PLANS/INTEGRATED RESOURCE PLANS/GENERATION MASTER PLANS

A 15-Year Generation Master Plan was completed by Tractebel for GRIDCo in 2011. The plan was used to determine the optimal technology options and capacity reserves needed to reach the required system reliability level.

The Generation Master Plan produced demand scenarios for demand up to 2026 (Figure 2). For the base case scenario, the total energy load demand is estimated to increase from 10,000 GWh in 2010 to 28,000 GWh in 2026. The projected load demand for the base case scenario translates into an increase in peak load from 1,531 MW in 2010 to 4,161 MW in 2026, representing an average annual growth of 6.5%. Ghana will require 200 MW per year to keep up with demand.

FIGURE 2: DEMAND FORECAST FOR GHANA



The Master Plan was based on the Bui Hydropower plant coming online in 2013 (success), the use of natural gas from Nigeria imported through the West African Gas Pipeline (WAGP) (minimal success), and development of the domestic Jubilee Fields for electricity generation (success with oil, but very little with gas).

Ghana is in the process of finalizing its Gas Master Plan which will be translated into new legislation and regulations, a process for which the Ministry of Petroleum has requested assistance from Power Africa/USAID.

Investments were expected to be made in combined cycle gas turbine (CCGT) units, while dependency on large hydro generation was expected to decrease. Some investment in small hydro was foreseen as well as the installation of solar photovoltaics and wind farms. In reality, the development of renewable energy has been much slower than envisaged, with only 7.4 MW of new capacity added, including the 2 MW VRA grid-connected solar PV plant, 3.8 MW of off-grid and distributed generation including the 715 kW Noguchi solar plant developed by Japan for a medical center, and a 475 kW palm oil mill plant for a boiler and hospital. In order to meet the Master Plan targets, the government will need to aggressively attract new investors.

The GoG seems to be stepping back from its master plan goals for an increased share of renewable energy and instead has been focusing on incorporating large-scale conventional fuels into the grid. In May 2015, the MOP announced that in order to meet the country's power demand, priority will shift to constructing a minimum of five 1 GW coal-fired power plants along the coast. There are also plans to increase thermal generation from the Jubilee and Sankofa gas fields. The pursuit of thermal options is given impetus by the experience of hydro-electric water shortages as well as renewable energy being unable to offer baseload generation. Another factor has been the disappointing amount of gas transported to Ghana from Nigeria through the WAGP.

Although it was useful for GRIDCo to have planning studies done, there has been little to no indication of how they will work with other utilities to ensure its success and what plans there may be to update plans in light of changed expectations.

A ten-year (2011-2020) Transmission System Master Plan was also developed for GRIDCo by Tractebel in 2010 to serve as a roadmap for all new investments in the transmission network.

The transmission infrastructure consists of about 5,100 km of high voltage lines and 54 transformer substations, and is interconnected with neighboring countries: Togo and Benin in the east; Burkina Faso to the north; and Cote d'Ivoire in the west. Inadequate investment, coupled with power generation constraints, has resulted in low power factors and increases in transmission losses.

No integrated resource plan (IRP) currently exists in Ghana. However, USAID has called for proposals in this regard. USAID has also just called for a tender to deliver an Integrated Resource and Resilience Program (IRRP) for the Ministry of Power and the entire power sector. This will be a multi-year project aimed at creating an integrated approach to power sector planning and development on a nationwide basis. In addition, Germany, via GIZ, is also conducting a grid integration study and transmission reinforcement study for variable renewables and a renewable energy grid code.

GRIDCo and the GoG may wish to update the Generation and Transmission Master Plans once there are clearer results from proposed scenarios articulated in the IRRP regarding Ghana's medium- and long-term renewable energy generation capacity. There is also a need to hold different institutions accountable for delivering the plan.

2.5 POWER GENERATION PROCUREMENT FRAMEWORK AND PROCESSES

The EC's Framework for the Procurement of Electric Power Generation, along with other policies, has not been successful in attracting the required investments into the power sector. This framework should be re-assessed to identify the improvements required to guarantee that it meets the expectations of investors while protecting the interest of the public.

The process for adding generation capacity in Ghana is on a negotiated, transaction-by-transaction basis. But this has resulted in far too few investments. The GoG should implement a rigorous ICB framework for procuring least-cost power generation projects (LCGPs) facilitated by a technical PPU. The GoG has agreed to a project with Power Africa that would introduce an ICB framework to insure LCGPs. One of the main components of the new MCC Compact with Ghana is to establish a competitive tendering process for IPPs.

The World Bank recommended in 2013 that a full-time IPP expert be employed to lead an open, competitive solicitation and contracting process that is based on standardized terms.

The GoG is also working on a PPP Law, which will set clear qualification criteria and a process for evaluating unsolicited bids.

2.6 ELECTRIFICATION TARGETS, PLANNING AND EXECUTION (FOR GRID AND OFF-GRID)

As part of NES, 643 communities were connected to the national grid in 2012, bringing the total number of communities connected nationally to about 5,500 and a national average coverage of grid-connected and off-grid households to about 72%. All regional and district capitals have been connected to the national grid. Funding had been secured for about 2,000 communities earmarked

for electrification in 2013 and beyond. Despite Ghana's high electrification rate, there is a large disparity between electricity access in Ghana's urban areas (90%) versus rural areas (52%).

Although the NES has been perceived as successful, the Netherlands Enterprise Agency (RVO.nl) noted that there has been a lack of enthusiasm from communities for off-grid or decentralized power due to the cost and power limitations: people preferred to wait for grid extension to their homes. It also stated that grid expansion is now much slower than previously planned because of inadequate electricity production, high transmission costs, and increasingly high subsidies required for each connection. Rooftop solar programs are also not covered by the same subsidies as NES users.

However, the Renewable Energy Act of 2011 provides renewable power producers with rights to grid access including preferential treatment over conventional fuels in rural electrification. The World Bank also reported that the Energy Development and Access Project had provided solar PV systems to 17,000 remote rural households since the project's start in 2007 (World Bank, 2015). This proved to be a successful business model involving the participation of small rural credit agencies for distributing PV systems to remote rural communities where the grid is not expected to reach. One activity that is still being implemented is the construction of pilot mini- and micro-grids in inaccessible areas in and around Lake Volta. The construction of these systems is expected to be completed by the third quarter of 2015; the contractor will operate them until July 2017, under a contract with the Ministry of Power, when they will be turned over to the Ministry.

In 2014, Ghana received a five year USD 469.3 million grant through its second Millennium Challenge Compact. The Compact is defining projects required to address Ghana's inadequate power supply, examining market barriers to entry, recommending ways to strengthen opportunities for off-grid solutions, and designing outreach approaches. These investments will ultimately improve the reliability and accessibility of electrical power for over 2.6 million customers (Power Africa 2014 Annual Report). In the context of grid power shortages, distributed generation becomes an attractive option to meet rural electrification targets.

Power Africa has proposed to work with the World Bank and the MCC in completing a comprehensive rural electrification plan for the country that would include both on- and off-grid areas, and focus specifically on scaling up productive uses of energy.

3 GHANA'S POLICIES AND LAWS FROM A GENDER EQUALITY AND FEMALE EMPOWERMENT PERSPECTIVE

A comprehensive gender analysis of the energy-related legal and policy framework in Ghana is beyond the scope of this section. A few selected provisions from key policies are highlighted and some gaps are noted that may be relevant for Power Africa when planning interventions for legal and policy reform.

Ghana has a National Gender and Children Policy. The policy states that the Ministry of Women and Children will collaborate with the Ministry of Power to ensure that issues that relate to women are given the necessary attention. Gender mainstreaming is the overall policy goal and there are specific objectives listed. These include providing a national framework from which policies are derived, and promoting women's equal access to, and control over, economically significant resources and benefits. The Gender and Children Policy should therefore inform the implementation of energy policy in Ghana.

The 2010 National Energy Policy includes a section on energy and gender, which cites gender mainstreaming in the energy sector as a policy goal. The limited involvement of women in the planning and management of energy services and the paucity of women in management positions are cited as challenges in the energy sector. The policy notes that the government will support the capacity development of women in the energy sector and ensure women's participation in the formulation and implementation of energy interventions.

The Energy Sector Strategy and Development Plan of 2010 includes strategies to implement the stated policy goal of gender mainstreaming. For example, towards addressing the concerns of women in energy, policy formulation and implementation of the strategy include capacity building for women in energy and the establishment of a gender desk at the Ministry of Power.

ECOWAS has developed a Policy for Gender Mainstreaming in Energy Access to "provide policy-makers with instrumental and human rights based indicators and rigorous arguments to align energy policies, programs and initiatives with principles of gender equality." The policy aims to "use a gender mainstreaming framework as a means for Energy Ministries to achieve energy access goals in a way that leverages the role of women as energy users, community members, business owners, and policymakers." It is envisioned that the policy will be adopted by the end of 2015. Its implementation will be effective from 2016 to 2030, and will follow the enshrined implementation plan. The policy also includes a monitoring plan. The Ministry of Power will work in collaboration with the ministry in charge of gender to support the implementation and monitoring of the policy. This is an innovative and important policy development in West Africa. With sufficient capacity and effective advocacy for its implementation, the policy will be an important regional instrument to guide gender mainstreaming in the energy sector at the national level, including in Ghana, and to strengthen gender mainstreaming in policy-making and implementation.

4 DONOR ASSISTANCE TO GHANA

Relevant ongoing, recent and upcoming donor activities in Ghana include:

- The ongoing World Bank Ghana Energy Access and Development Project (GEDAP) is valued at USD 210.55 million. It comprises four principal components: energy sector and institutional development, electricity distribution system improvement, transmission system upgrade, and electricity access expansion and renewable energy development. GEDAP is currently in the development of its third phase for additional financing of USD 60 million, which will extend the project until 2017 and help ECG further reduce technical losses, improve supply quality to clients, connect more customers, and increase revenue collection in the project areas. In July 2015, it was announced that the World Bank would invest USD 700 million in guarantees for Ghana's Sankofa Gas Project, which is expected to increase Ghana's gas power generation by 1 GW from gas developed in the offshore field.
- NES is also supported by the Japan International Cooperation Agency (JICA), Danish International Development Agency (DANIDA), World Bank, the Dutch Development Related Export Transactions Program (ORET), and the Swedish International Development Cooperation Agency (SIDA) through grants and soft loans.
- The Self-Help Electrification Project (SHEP) receives financial support from the Export-Import Bank of India, the Export-Import Bank of the United States, Export-Import Bank of China, SIDA and the South African Government through soft loans.
- The MCC Compact 2 will be the largest project at USD 469,3 million with a focus on 1) the ECG Financial and Operational Turnaround Project, 2) the NEDCo Financial and Operational Turnaround Project, 3) the Regulatory Strengthening and Capacity Building Project, 4) the Access Project, 5) the Power Generation Sector Improvement Project, and 6) the Energy Efficiency and Demand-Side Management Project. The GoG has also pledged to invest at least USD 37.4 million of its own money, and the compact is expected to catalyze approximately USD 4 billion in new private investment and activity in the coming years.
- AfDB provides loans for the Ghana-Togo-Benin Power Interconnector as part of the West African Power Pool, as well as for the Kumasi Power Reinforcement and the Takoradi Expansion Project. In the pipeline is an IPP project in Tema (340 MW CCGT) and the expansion of an existing 220 MW simple cycle power plant to combined cycle.
- Agence Française de Développement (AFD) supports VRA in the retrofit of the Kpong hydropower dam and studies hydropower sites along the White Volta and Oti rivers as well as providing support to GRIDCo in connecting Ghana to Burkina Faso.
- The State Secretariat for Economic Affairs of Switzerland (SECO) provides support through the World Bank's GEDAP project and provided capacity building assistance to PURC and ECG/NEDCo from 2009-2012.
- The China ExIm Bank and the China Commercial Bank provide loans for grid extension to 400 communities in the Upper West Region and 500 communities in the Northern Region.
- JICA provides grants for the improvement of the distribution system (new sub-transmission lines), solar PV systems (a 720 kVA system at the Noguchi Memorial Institute for Medical Research, University of Ghana, Legon) and training of electric engineers.
- Germany, via KfW, provided a loan for the development of a 12 MW solar PV project with VRA at three sites in the Upper West Region. The first solar PV plant of 2.5 MW was commissioned in 2013 and supports the WAPP: Ghana- Cote d'Ivoire Interconnection Line.

- Germany, via GIZ, supports the successful implementation of the Renewable Energy Act of 2011 through advisory services on grid-connected renewable energy, in particular regarding the procurement strategy for utility-scale solar and wind capacity, the renewable energy purchase obligation for electricity bulk customers and utilities, the renewable energy licensing regime, a grid integration study and transmission reinforcement study for variable renewables, the Renewable Energy Grid Code and the Net Metering Code.
- The European Union is active in sustainable energy for rural electrification projects, predominately through Jatropha and other biomass sources.

There seems to be a good deal of donor crowding towards off-grid electrification and improving ECG's operations. Given the recent news that the ECG will soon operate as more of a commercial entity through Power Africa to attract more IPPs in Ghana, other donors may wish to re-think their proposed capacity building assignments for ECG.

Other donors are also focusing a good deal on bilateral or multilateral interconnections, mainly through WAPP. All of these improved or new interconnections should be taken into account for IRRP to ensure that additional power can be imported or power could be exported against a business-as-usual case scenario.

Last, there is minimal support for energy efficiency and demand-side management other than mostly lowering technical losses for ECG. Although decreased demand or need on the consumer side tends to be a focus for more advanced markets, there should be more options available to residential and commercial users to lower their energy bills through the installation of energy-efficient appliances and incentives to do so such as tax credits or rebate programs. This could slightly lower the 5,000 MW target for power generation, which Power Africa has determined may be too large given the amount that will be generated from plants that can actually reach populations.

5 RECOMMENDED POLICY INTERVENTIONS FOR INCREASING INVESTMENT AND ACCESS

5.1 ENERGY POLICIES

Ghana's economy has been under considerable stress for the past few years and, as a result of the severe economic constraints, the GoG entered into an agreement in 2015 with the World Bank and IMF providing for the implementation of a stabilization and austerity program. The aim of this program is to set the foundation for firm and sustained economic growth in the years to come.

Part of the austerity program includes an agreement to limit the additional debt Ghana will incur, including limitations on GoG guarantees, which can be considered "contingent claims", obligating the GoG to future payments in certain events. This restriction on GoG guarantees limits its ability to provide the GCSAs. Without such guarantees, IPPs are unable to obtain the debt financing required for their transactions and thus cannot achieve financial closure with debt financing providers.

As a consequence, with a limit on the amount of the total GCSAs available, the number of transactions is necessarily also limited.

To address this impediment, it is recommended that the GoG develop appropriate credit support packages that meet international lender and commercial banks requirements. Such a package would amongst others ensure the creation of bankable IPP transactions (including use of the GCSA and where possible some combination of other credit enhancement tools (LOCs, PRGs, Insurance, etc.).

5.2 ENERGY REGULATORY FRAMEWORK AND TARIFFS

Regarding tariffs, it is advisable for PURC to enact new 20 year FITs, which would enable longer debt amortization periods and hence should increase investment. We understand that PURC has already decided to publish 15 and 20 year FITs and this will happen in October 2015. It remains to be seen what level will be set.

Cost-reflective tariffs are needed in order to enable financial sustainability and creditworthy off-takers for IPPs. In order to achieve this, PURC should be given the authority to enact new consumer tariff levels without GoG influence. We understand that PURC is being assisted by MCC in its current round of tariff reviews.

There is also scope for capacity building and training for both PURC and EC staff.

5.3 POWER SECTOR DEVELOPMENT PLANS/INTEGRATED RESOURCE PLANS/GENERATION MASTER PLANS

Currently, there is no clear and long-term IRP to meet renewable energy integration targets with power expansion. It is recommended that the GoG develop an IRRP that reflects the country's goals for increased renewable energy generation, with utilities and institutions having the capacity to follow plan guidelines.

5.4 POWER GENERATION PROCUREMENT FRAMEWORK AND PROCESSES

One of the most useful improvements Ghana can make to its power generation procurement framework process would be to create clear bidding rules and designate a single procurement authority for project developers. In order to increase its power capacity, Ghana needs to set up the institutional capacity to run effective international competitive tenders for new power generation (including for solar, wind and gas). The tender framework should include a clear contracting framework with standard PPAs and other relevant commercial contracts (e.g., Implementation Agreement, Direct Agreement, Grid Connections Agreements). It is recommended that a PPU¹² which is supported by experienced transaction advisors be established.

5.5 ELECTRIFICATION TARGETS, PLANNING AND EXECUTION (FOR GRID AND OFF-GRID)

An ongoing challenge is underperformance by distribution utilities ECG and NEDCo, which suffer from system losses of over 20% due to underinvestment, poor billing and collections, and a weak management structure, which will continue to plague Ghana's universal electrification plans. A success story under USAID's Africa Infrastructure Program, and continued with Power Africa, is change management programs at ECG that focused on improving management and technical practices in district-level operations. These programs have reduced the amount of load shedding, technical losses and customer service complaints by forming performance improvement teams. This program should continue to be expanded to other ECG districts as well as to NEDCo.

As part of efforts to address the performance challenges at ECG, MiDA has signed a contract with IFC for procurement (through an international competitive process) of a concessionaire to take over the operations of ECG for a stated period of time.

It is also recommended that the GoG clearly articulates on-grid and off-grid electrification policy with attractive incentives for investors, developers and consumers, including the design of a subsidy structure for off-grid solutions to ensure financial viability of such projects.

¹² We understand from PATRP's Transaction Advisor in Ghana that efforts to commence a work stream to develop a PPU which would lead to ICB and least cost generation acquisition planning met with a stone wall. However, we still believe that this is an important policy intervention to be mentioned in this Draft Report, at this stage.

5.6 GENDER EQUALITY AND FEMALE EMPOWERMENT

Increased gender equality and women's empowerment in the energy sector is increasingly attractive to private investment and is smart economics. The policy provisions highlighted in Section 3 focuses on gender mainstreaming in the energy sector and promoting women's participation.

Gender mainstreaming, while often prescribed in policy, is commonly not understood by those tasked with applying gender mainstreaming as a strategy for gender equality. Support for capacity building for gender mainstreaming, to increase the understanding of policy makers and implementers of gender and energy, and the necessity of women's participation in planning and decision-making is an important and necessary intervention. The Ministry of Power has a gender focal point. This is a good starting point to assess existing capacity and identify needs and other stakeholders. The ECOWAS policy on gender mainstreaming in the energy sector is an important entry point to support gender mainstreaming in Ghana and opportunities to partner with ECOWAS in this respect should be explored.

6 RECOMMENDED TECHNICAL ASSISTANCE FOR INCREASING INVESTMENT AND ACCESS

TABLE 6: RECOMMENDED TECHNICAL ASSISTANCE

To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity

Policy Intervention	Technical Assistance	Active Donors in this Space	Donor(s) Recommended to Provide Support
Development of a credit support package to create bankable IPP transactions (including use of the GCSA and where possible some combination of other credit enhancement tools (LOCs, PRGs, Insurance, etc.))	Support with the development of credit support packages meeting international lender and commercial banks requirements ¹³	MCC Compact 2 USAID, through Power Africa	MCC USAID, through Power Africa
Development of cost reflective tariffs	Support provided to PURC and GoG in agreeing to and honoring tariff revisions and developing cost reflective tariff framework for implementation going forward	MCC Compact 2	MCC USAID, through Power Africa if need be
Development of an IRRP that reflects the country's goals for increased renewable energy generation, with	Assist the GoG (MOP, MOPET, MOFEP and Ministry of Finance) with development of an IRRP, aimed at an integrated approach	USAID is currently evaluating proposals for a multi-year IRRP program which will	USAID

¹³ PATRP Transaction Advisor is currently working with both the MOP and several IPPs on a new instrument incorporating a PCOA which may enable the GoG to avoid debt treatment under the IMF agreement while enabling IPPs to satisfy the requirements of international lenders.

TABLE 6: RECOMMENDED TECHNICAL ASSISTANCE**To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity**

Policy Intervention	Technical Assistance	Active Donors in this Space	Donor(s) Recommended to Provide Support
utilities and institutions having the capacity to follow plan guidelines	to power sector planning and development on a nationwide basis Build capacity for undertaking IRPs in the future	likely commence at the beginning of 2016	
Implementation of an ICB framework for procuring least-cost power generation projects Creation of a PPU, resourced with skilled and experienced Transaction Advisors	Assist the GoG with the design of the ICB framework including preparing standardized draft PPAs and other relevant commercial agreements (Implementation Agreement, Direct Agreement, Grid Connection Agreements) Assist the GoG with the organizational design and establishment of the PPU ¹⁴ Provide transaction advice when running competitive tenders	USAID	USAID
On-grid and off-grid electrification policy articulated with attractive incentives for investors, developers and consumers, including the design of a subsidy structure for off-grid solutions to ensure financial viability of such projects	Assist the GoG with enhancing their electrification planning, including the mix between mini-grid and off-grid options and the design of a subsidy structure to ensure the financial viability of off-grid projects	USAID, through Power Africa: the renewables work stream, currently under finalization, will support off-grid/mini-grid activities, as well as assist the MOP, Energy Commission and other stakeholders to evaluate the long list of potential renewable energy projects	USAID
Gender mainstreaming	Support gender mainstreaming capacity building	Spanish Agency for Development Cooperation, United Nations Industrial	Spanish Agency for Development Cooperation, UNIDO, EU, UN Women, SIDA

¹⁴ We understand from PATRP's Transaction Advisor that efforts to commence a work stream to develop a PPU which would lead to ICB and least cost generation acquisition planning met with a stone wall. However, we still believe that this is an important policy intervention to be mentioned in this Draft Report, at this stage.

TABLE 6: RECOMMENDED TECHNICAL ASSISTANCE To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity			
Policy Intervention	Technical Assistance	Active Donors in this Space	Donor(s) Recommended to Provide Support
		Development Organization (UNIDO), EU	

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RECOMMENDED POLICY INTERVENTIONS FOR TRANSACTIONS

Summary of Key Impediments

The key impediments to closing transactions in Ghana occur at several levels:

- National/country issues
- Ministry issues
- Transaction-specific issues
- External limitations.

National/country issues: Ghana's economy has been under considerable stress for the past few years and, as a result of the severe economic constraints, the GoG entered into an agreement in 2015 with the World Bank and IMF providing for the implementation of a stabilization and austerity program. The aim of this program is to set the foundation for firm and sustained economic growth in the years to come.

Part of the austerity program includes an agreement to limit the additional debt Ghana will incur, including limitations on GoG guarantees, which can be considered “contingent claims”, obligating the GoG to future payments in certain events. This restriction on GoG guarantees limits its ability to provide the GCSAs. Without such guarantees, IPPs are unable to obtain the debt financing required for their transactions and thus cannot achieve financial closure with debt financing providers.

As a consequence, with a limit on the amount of the total GCSAs available, the number of transactions is necessarily also limited. The list of transactions in line to obtain GCSAs is short and, fortunately, includes most of the projects currently considered to be Power Africa priority transactions. The GoG has imposed an additional restriction (in most cases) that recipients of GCSAs also be approved by the World Bank for a partial risk guarantee which, to some extent, provides a substitute for the liquidity obligation under the GCSA.

Another national issue is the total demand for additional generation. While the GoG has a goal of putting in place 5,000 MW of generation infrastructure by 2016/17, there is clear indication from a number of recently concluded studies that there is insufficient demand for this level of generation capacity until the mid-2020s. Nonetheless, motivations to meet promises from the previous elections, on top of the issue of national load shedding, have fueled a virtual “feeding frenzy” of potential projects. As a result, existing generation capacity, when combined with the projects currently under construction and in the final process of approval, more than meet the target of 5,000 MW, raising the specter of idle capacity with high fixed charges, which will have to be paid for regardless of whether the power is ever produced.

Another result of this frenzy to add power generation capacity is illustrated by the number of projects with provisional licenses from the Energy Commission. At last count, excluding all projects constructed, under construction or approved for construction, there were 129 provisional license holders (58 thermal and 71 renewable projects) representing a total of over 25 GW of potential power generation. Of those, solar accounted for 49 of the license holders for a total of 3.5 GW, more

than the total of all existing generation infrastructure (2.85 GW) currently in situ. While it is likely that most of these projects will not be completed, one can see that there is no shortage of transactions in Ghana.

Ministry issues: The Ministry of Power manages the portfolio of power sector state-owned enterprises and the related regulatory agencies. Among its portfolio is the Electricity Company of Ghana (ECG). While ECG enjoyed a period of sound financial development and management, a number of factors have contributed to the erosion of the company's financial position (non-cost reflective tariffs, under-investment, mismanagement, high arrears (accounts receivables) from other SOEs, etc.) to the point that ECG is no longer viewed as a creditworthy off-taker by international lending institutions and commercial banks.

IPPs seeking to complete transactions in Ghana normally rely on the strength of the PPA signed with the off-taker to secure debt financing for their projects. As ECG, the main off-taker for all IPP projects, is not creditworthy, IPPs have requested that the GoG backstop (guarantee) the PPA with a government consent and support agreement. While the GCSA is not a "full faith and credit obligation" of Ghana, it is a Parliament-approved document which, to date, has satisfied international lending institutions and commercial banks, enabling them to provide the required debt financing for transactions. To date, one transaction, Cenpower, a 350 MW greenfield IPP transaction, has utilized this structure and successfully closed its debt financing in 2014, establishing a "template" that all other IPP transactions are endeavoring to follow. In summary, a commercially viable PPA from ECG in conjunction with a GCSA backstop have proven to be a "bankable" structure.

Transaction-specific issues: In the case of the renewable transactions in process, there are a number of issues requiring resolution relating to tariffs that exceed published FIT levels or project size limits published subsequent to the signing of the PPA. These issues require bilateral negotiations between the project sponsors and the GoG stakeholders. These are only mentioned due to the fact that without resolution, the process of Parliamentary approval will be delayed.

As noted above, all of these transactions will need to deal with the current restrictions on GCSAs. Additional transaction-specific issues are covered in the tables below.

External limitations: It is critical to recognize that the amount of debt financing available for power generation projects in Ghana is limited. As each successive transaction is completed, the pool of available debt for the next transaction shrinks. Moreover, while the GoG may be an inadequate regulator of the number of projects and megawatts being added, the financial institutions will become increasingly circumspect of additional projects, ultimately limiting the number of IPP projects that can be developed and financed on a traditional project financing basis.

Ghana 1000 (750 MW CCGT + 500 mmscfd LNG); Ghana 300 (342 MW CCGT); Globeleq (450 MW CCGT)		
Policy and Regulatory Barriers to Transaction(s)	Recommended Intervention & Effect	Technical Assistance Required
<p>Generation: None, the deregulated market, legal and regulatory frameworks are in place and adequate for transaction completion.</p> <p>LNG: None.</p>	<p>Generation: None</p> <p>LNG: None</p>	<p>Generation: None</p> <p>LNG: None</p>
<p>Electricity Company of Ghana (ECG). The primary off-taker for all IPPs in Ghana, ECG operates as a portfolio company under the Ministry of Power.</p> <p>As the consequence of tariffs that do not reflect costs (over an extended period) and other factors, ECG is not viewed as a creditworthy off-taker by international lending institutions and commercial banks.</p>	<p>Short/Medium Term: Support IPP transactions with the GoG guarantee (GCSA) where possible, and, to the extent possible, some combination of other credit enhancement (LOCs, PRGs, Insurance, etc.) to create “bankable” IPP transactions.</p> <p>Long Term: Privatization or other form of private sector participation to fix ECG in the long term. Cost-reflective tariffs.</p>	<p>Short/Medium Term: Transaction advisor working with IPPs, MOP, MOFEP, ECG, WB and others to create credit support packages meeting international lender and commercial bank requirements.</p> <p>Long Term: MCC Compact 2, a USD 498 million program over a five-year implementation period, three-quarters of which is targeted at ECG to introduce a private sector partner on a long-term concession basis.</p>
<p>End user tariffs do not cover the underlying cost for power generation, transmission and distribution, and do not provide a margin sufficient to cover needed investment in the sector.</p>	<p>PURC, the regulator, after a two-year hiatus, reinstituted annual tariff reviews in 2013 along with a quarterly adjustment mechanism. Currently PURC is in session with the sector and reviewing tariffs for the scheduled October announcement.</p>	<p>As a condition precedent to MCC’s second compact entering into force, the GoG has reinstituted annual tariff reviews and mandatory quarterly adjustment mechanisms which are intended to bring tariffs into alignment with costs over time.</p>

Ghana 1000 (750 MW CCGT + 500 mmscfd LNG); Ghana 300 (342 MW CCGT); Globeleq (450 MW CCGT)		
Policy and Regulatory Barriers to Transaction(s)	Recommended Intervention & Effect	Technical Assistance Required
<p>Generation: As noted, non-cost reflective tariffs have financially constrained investment (maintenance and development) in the sector. In addition, due to depleted reservoir levels stemming from several years of reduced rainfall, existing thermal plants have been running at full capacity, resulting in technical degradation and unscheduled outages.</p> <p>Transmission: GRIDCo operates the backbone grid and has been able to continue network development with the assistance of loans from international development partners. Similar development of the WAPP interconnections is in process. As a result, the backbone grid is in reasonable condition for the addition of additional thermal generation.</p> <p>Distribution: ECG and NEDCo are in the process of upgrading all major substations to manage increased load requirements. System technical losses remain significant (over 20%) due to underinvestment. Network coverage is estimated at 76% nationwide with a goal of universal access by 2017 (90%).</p>	<p>Generation: For existing thermal plants, the GoG requires training in O&M areas and plant redevelopment assessment.</p> <p>Transmission: While the network is reasonably sound and developing well, GRIDCo has limited capacity for assessing long-term development needs on an integrated basis.</p> <p>Distribution: Network revitalization program and an integrated approach to system development.</p>	<p>USAID has agreed with GoG on an extensive, multi-year program of technical assistance with the MOP, Ministry of Petroleum (MOPET), and Ministry of Finance and Economic Planning (MOFEP) with the goal of supporting the generation, transmission and distribution sectors under the PATRP contract. In addition, USAID has just tendered for a consultant to deliver an IRRP, a multi-year project aimed at creating an integrated approach to power sector planning and development on a nationwide basis.</p>

Ghana 1000 (750 MW CCGT + 500 mmscfd LNG); Ghana 300 (342 MW CCGT); Globeleq (450 MW CCGT)		
Policy and Regulatory Barriers to Transaction(s)	Recommended Intervention & Effect	Technical Assistance Required
The process for adding generation capacity in Ghana is on a negotiated, transaction-by-transaction basis. As a consequence, the GoG has been inundated with IPPs interested in securing a position to develop projects in Ghana.	Implement a rigorous, ICB framework for procuring least-cost power generation projects. Create a Private Power Unit consisting of representatives of all power sector stakeholders to oversee the development of all power sector generation projects.	USAID has agreed with the GoG on an extensive, multi-year program of technical assistance with the MOP, MOPET and MOFEP, with the goal of introducing an ICB framework to insure LCGPs.
Ghana has a Generation, Transmission and Distribution Master Plan (prepared by Tractabel). However, the GoG has encouraged IPPs to develop projects and has set a national target of 5,000 MW by 2016. The GoG has also set a goal of universal access to grid-connected power. To this end, it has supported the Self-Help Electrification Program, which is continuously extending the distribution network.		USAID has agreed with GoG on an extensive, multi-year program of technical assistance with the MOP, MOPET, and MOFEP, with the goal of supporting the generation, transmission and distribution sectors under the PATRP contract. In addition, USAID has just tendered for a consultant to deliver an IRRP, a multi-year project aimed at creating an integrated approach to power sector planning and development on a nationwide basis.
While there is a “road map” available for IPPs to follow, guiding them through the various steps in moving projects from provisional license to construction permit, IPPs have chosen various additional routes to developing their projects, including entering into MOUs with the MOP, VRA or ECG, among others	Create a Private Power Unit consisting of representatives of all power sector stakeholders to oversee the development of all power sector generation projects. The GoG has recognized the issue and has indicated its intention to address the systemic irregularities.	USAID has agreed with the GoG on an extensive, multi-year program of technical assistance with the MOP, MOPE and MOFEP, with the goal of introducing, developing and training a PPU.

Ghana 1000 (750 MW CCGT + 500 mmscfd LNG); Ghana 300 (342 MW CCGT); Globeleq (450 MW CCGT)		
Policy and Regulatory Barriers to Transaction(s)	Recommended Intervention & Effect	Technical Assistance Required
As noted above, GoG has set a goal of universal access to grid-connected power. To this end, it has supported the SHEP Program, which is continuously extending the distribution network.	<p>Once power is delivered on a reliable basis, the goal of a 90% grid connected population should be achieved. It is likely that connectivity in the northern two-thirds of Ghana will remain below 90%. In addition, remote areas, particularly surrounding the Volta basin, will remain off-grid for the foreseeable future.</p> <p>The GoG is analyzing off-grid solutions and is pilot testing four such systems. The next step is resolving how such systems will operate in a market that requires all on- and off-grid systems to charge the same end-user tariffs. Under this requirement, off-grid solutions encounter difficulty achieving financial viability without some sort of subsidy structure.</p>	USAID has agreed with the GoG on an extensive, multi-year program of technical assistance with the MOP, MOPE and MOFEP, with the goal of evaluating opportunities to assist in distributed power and off-grid solutions.
Ghana is a financially constrained economy that has recently entered into an agreement with the IMF, which imposes restrictions on external borrowing, including limitations on the issuance of GoG guarantees. This agreement constrains the ability of IPPs to obtain GCSAs to meet bankability standards.	Support IPP transactions with the GoG guarantee (GCSA) where possible and, to the extent possible, some combination of other credit enhancement (LOCs, PRGs, insurance, etc.) to create “bankable” IPP transactions.	Transaction advisor working with IPPs, MOP, MOFEP, ECG, World Bank and others to create credit support packages meeting international lender and commercial bank requirements.

Upwind Ayitepa (225 MW Wind); Siginik Energy (50 MW Solar); APSD (50 MW Biomass)		
Policy and Regulatory Barriers to Transaction(s)	Recommended Intervention & Effect	Technical Assistance Required
<p>Same as for thermal projects above except as indicated below.</p> <p>Ghana has implemented renewable energy legislation using a FIT structure with a 10-year period, negotiated thereafter every second year. PURC has gazetted FITs in October 2013 and 2014.</p> <p>A few IPPs have indicated that the ten-year FIT is not long enough to reach a bankable structure as it does not fix the rate for the entire debt amortization period.</p> <p>None of the current projects covered by this schedule has indicated the 10-year FIT is an issue and in several cases has strong indications of interest from potential providers of debt financing. They are satisfied that having a 20-year PPA is sufficient.</p>	<p>Same as for thermal projects above except as indicated below.</p> <p>A longer FIT is required to remove this roadblock for some companies.</p> <p>PURC intends to set new 10, 15 and 20 year FITs that will be published in October 2015, removing this impediment to bankability.</p>	<p>Same as for thermal projects above except as indicated below.</p>
<p>Same as for thermal projects above.</p>	<p>Same as for thermal projects above.</p> <p>Note: Each of the renewable projects is pursuing a modified version of the GCSA using a Put call options agreement (PCOA) in place of the main backstop provision. This structure requires approval by MOP, MOFEP, WB and IMF, but if approved, will remove treatment of the GoG guarantee as a contingent debt obligation, enabling these (and other projects) to move forward with their next steps toward financing.</p>	<p>Same as for thermal projects above.</p> <p>Note: The transaction advisor is working with all parties to see if consensus can be reached on the new structure.</p>

Upwind Ayitepa (225 MW Wind); Siginik Energy (50 MW Solar); APSD (50 MW Biomass)		
Policy and Regulatory Barriers to Transaction(s)	Recommended Intervention & Effect	Technical Assistance Required
<p>Same as for thermal projects above except as indicated below.</p> <p>An additional complexity with renewables is the intermittent nature of solar and wind. This has prompted additional requirements to provide a grid impact assessment for each intermittent renewable transaction.</p> <p>Both Upwind Ayitepa and Siginik Energy have submitted grid impact assessments and GRIDCo is satisfied these projects will not present issues of grid instability.</p> <p>APSD is a base load renewable project and, therefore, does not present the same issue.</p>	<p>Same as for thermal projects above except as indicated below.</p>	<p>Same as for thermal projects above except as indicated below.</p>
<p>Same as for thermal projects above except as indicated below.</p> <p>As noted, intermittent renewable power, in a market with insufficient base load generation to meet peak demand, creates complications.</p> <p>GoG has thus set targets for renewables and specific limitations for solar power until it can assess the impact on the national system.</p> <p>There is a target on renewable power of 10% of generation (450 MW). The solar limit is 150 MW, and any project in excess of 10 or 20 MW (depending upon location) must provide for back-up capacity for amounts in excess of 20 MW. Wind is limited to 300 MW.</p>	<p>Same as for thermal projects above except as indicated below.</p> <p>Upwind Ayitepa and Siginik Solar have been grandfathered from any capacity restrictions, though they still require Parliamentary approval of their PPAs and a resolution to the GCSA situation.</p> <p>Note: The limits on renewable generation are not applicable to hydro, biomass or waste-to-energy.</p>	<p>Same as for thermal projects above except as indicated below.</p>

Upwind Ayitepa (225 MW Wind); Siginik Energy (50 MW Solar); APSD (50 MW Biomass)		
Policy and Regulatory Barriers to Transaction(s)	Recommended Intervention & Effect	Technical Assistance Required
There is a target on renewable power of 10% of generation (450 MW). The solar limit is 150 MW, and any project in excess of 10 or 20 MW (depending upon location) must provide for back-up capacity for amounts in excess of 20 MW. Wind is limited to 300 MW.	GIZ and KfW are heavily involved in developing the renewables sector. For example, KfW is providing financing for 12 MW PV Solar being developed by Volta River Authority.	<p>The Power Africa transaction advisor is involved with all of the more advanced renewable transactions and is also in touch with many other projects, mostly in the solar sector.</p> <p>USAID has agreed with GoG on an extensive, multi-year technical assistance program of with the MOP, MOPET and MOFEP with the goal of evaluating opportunities to assist in renewable generation.</p>